and carried out by the Telegraph Construction and Maintenance Company, is now working satisfactorily. Unfortunately, however, it is found to be too costly for adoption except in very special cases.

(*To be continued.*)

A BILL TO PROVIDE TECHNICAL EDUCATION IN ENGLAND AND WALES.

THE following Bill, introduced into the House of Commons by Sir Henry Roscoe on behalf of the National Association for the Promotion of Technical Education, was read a second time without opposition on Wednesday, May 8 :—

Whereas it is expedient that due provision should be made for technical education in public elementary schools and elsewhere :

Be it therefore enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows :

1. This Act may be cited as the Technical Education Act, 1889.

2. (1) After the *passing of this Act* any school board may make provision for giving technical education in any school under their management, and either by day or evening classes, or both, as may seem fit, having regard to the daily occupations of the persons to be benefited thereby.

(2) If no such provision is made, or if it is insufficient, and if the local authority by special resolution determine that provision or further provision ought to be made, they may themselves make such provision.

3. Where technical education is given in any school, not being a public elementary school (including for the purposes of this section any college), which is not under the management of a school board or local authority, and is either within their district or accessible to the inhabitants thereof, the school board or local authority may contribute or they may join together with other school boards or local authorities in contributing from their respective funds towards—

(*a*) the maintenance or improvement of that school or of its provisions for technical education ; or

(*b*) the payment of the fees at that school of deserving students who before proceeding to such school have been resident in the district of the contributing board or authority ;

(*c*) the establishment of scholarships for deserving students.

The mode in which and the terms upon which contributory school boards and local authorities shall be represented upon the governing bodies of schools receiving such contributions, so far as technical instruction is concerned, shall be such as may be agreed upon between the school boards, local authorities, and governing bodies respectively in each case.

Every such contribution shall be deemed to be expenses of such school board or local authority incurred for the purposes of this Act.

4. (1) *Where any school in which technical education is given in pursuance of this Act is also a public elementary school, a parliamentary grant may be made to such school by the Education Department and by the Science and Art Department, or by either of such Departments.*

(2) *The conditions required to be fulfilled by such school in order to obtain an annual parliamentary grant shall be those contained in minutes issued by the Committee of Council on Education.*

(3) Any minute made in pursuance of this section shall not come into force until it has lain on the table of both Houses of Parliament for one month.

5. (1) *Where any school in which technical education is given in pursuance of this Act is not a public elementary school, a parliamentary grant may be made to such school by the Science and Art Department, subject to such conditions as that Department may prescribe.*

(2) Any minute made by the Science and Art Department in pursuance of this section shall not come into force until it has lain on the table of both Houses of Parliament for one month.

6. (1) All the provisions of the Elementary Education Acts relating to the powers of school boards with respect to sufficient accommodation, fees, the combination of school boards, and the acquisition of land, shall apply to school boards in whose schools technical education is given, or to be given, under this Act ; and a school shall not cease to be a public elementary school within the meaning of the Elementary Education Acts by reason of technical education being given therein.

(2) A school which is under the management of a school board, and in which technical education is given under this Act, shall be conducted in accordance with the same regulations as an elementary public school under the Elementary Education Acts : Provided, however, that every such school shall be open to the inspection of any inspector appointed by the Department of Science and Art, as well as of Her Majesty's inspectors as defined in the Elementary Education Acts.

7. The expenses incurred by any school board in carrying this Act into effect, including any contributions made by the school board in aid of technical education in schools not under their management, shall be deemed to be expenses of the said school board within the meaning of the Elementary Education Acts, and payable accordingly.

A school board shall have the same powers of borrowing for the like purposes, but subject to the same consent and other conditions, as they have under the Elementary Education Acts.

8. The expenses incurred by a local authority in giving effect to this Act, including any such contributions as are above mentioned, shall be payable out of the local rate. The local authority shall have the like powers of borrowing for the purposes of this Act, but subject to the same conditions, as for other purposes.

9. The provisions of this Act with respect to a local authority shall not apply to the Metropolis.

10. It shall be competent for any school board or local authority, should they think fit, to institute an entrance examination in reading, writing, and arithmetic for persons desirous of attending technical schools or classes under their management, or to which they contribute.

11. For the purposes of this Act the expression "technical education" means instruction in—

(i.) Any of the branches of Science and Art with respect to which grants are for the time being made by the Department of Science and Art.

(ii.) The working of wood, clay, metal, or other material for the purposes of art or handicraft.

(iii.) Commercial arithmetic ; commercial geography ; modern languages ; book-keeping, and shorthand.

(iv.) Any other subject applicable to the purposes of agriculture, trade, or commercial life and practice, which may be sanctioned by a minute of the Department of Science and Art made on the representation of a school board or local authority that such a form of instruction is suited to the needs of its district.

12. The provision to be made for technical education under this Act may include the providing of school laboratories, apparatus for teaching and experiment, museums and their contents, libraries, books, workrooms, schools or schoolrooms, or the improvement of existing provisions of any of these kinds, and the maintaining of the same in such manner as may be necessary to give effect to this Act.

13. (1) Save as otherwise provided by this Act the expressions "school board," "public elementary school," "managers," "parliamentary grant," and "Education Department," respectively, have the same meaning in this Act as in the Elementary Education Acts.

(2) The expression "local authority" means in any borough the council of that borough, and elsewhere the district council if district councils are established under any Act of the present session of Parliament, but if not then the urban sanitary authority or where there is no urban sanitary authority the county council.

The expression "local rate" means in a borough the school fund or borough fund or borough rate, and elsewhere the general district rate or other rate corresponding thereto.

14. This Act shall not apply to Scotland or Ireland.

SCIENTIFIC SERIALS.

Bulletins de la Société d'Anthropologie, tome onzième, série iii., fasc. 4 (Paris, 1888).—Conclusion of M. Variot's paper on the removal of marks of tattooing ; and on an instrument for tattooing, by the same writer.—On the sacrum of a chimpanzee, by M. Chudzinski. In this case the sacrum was composed of seven vertebræ, the normal number in the Anthropoids being only five, or at most six.—A process for mounting histological specimens

© 1889 Nature Publishing Group

treated under paraffin, by M. Mahoudeau.—A description of the cranium and brain in two assassins, by MM. Fallot and Alezais. This communication gives a minute analysis of the convolutions and other parts of the hemispheres, while it supplies numerous and special measurements of the various parts of the skull together with the respective cerebral and cranial indices.—On the cranial alterations observable in rachitic conditions, by M. Regnault.—On the first temporal convolution in the right and left hemispheres, in the case of a person who was known to have suffered from deafness of the left ear, by M. Manouvrier.—A communication regarding the truth of the reports made by various travellers that cannibalism exists among the Fuegians, by M. Hyades. According to this writer there is absolutely no ground for this charge.—On a Peruvian bell, by M. Verneau.—On the antiquity of Egypt, and the evidences of its condition in prehistoric times, by M. Beauregard. In this very exhaustive article the author passes in review the material evidence remaining of the ages of cut and polished stone and of bronze. He believes that Egypt at the time of the Pharaohs exhibited the mixed condition of combining the use of flint implements with the simultaneous acquaintance with the means of extracting copper, and blending it with other metals, including tin, although no distinct hieroglyphic for the latter has been recognized in the older language of Egypt. It remains undetermined where and when first the ancient Egyptians obtained the tin which enters into the bronze fabricated in the valley of the Nile as far back as the seventeenth century before our era.—On the birth-rate in France, by M. Chervin. This paper contributes the most elaborate and detailed series of statistical tables, for the separate departments, of the births, marriages, and deaths registered, as well as of the numbers of children born in a definite number of households. The means obtained from these lists show that 8 per cent. of all the marriages in France are sterile, and that while 25 per cent. yield only one child, 100 families supply a mean of only 259 children. Many curious points of interest are suggested by this complex report, but it does not do much to explain the causes of the want of increase in the population of France, as compared with that of other countries.—On the hinged and cantoned cross in Cyprian decorative art, by M. Max Richter. The remains of ancient art in Cyprus strongly resemble those of Hissarlik, excepting that there is no trace of the *swastika*, or hinged cross on the decorated red jars of the Bronze Age, while its later appearance and disappearance in Cyprian art appears to coincide with the predominance and decline of Phœnician influence.—On the survival in Brittany of some of the usages and privileges of clanship, by M. Sébillot.—On a semi-pagan procession on St. John's day, in the Basses Alpes, by M. Arnaud. From time immemorial the peasants of Lauzet have proceeded after the benediction of the neighbouring lake to throw stones into its waters amid loud and angry cries of vengeance against the evil spirits who bring rain and hail storms. In this strange ceremony the local *curé* is constrained by popular will to take part.—On phallotomy among the Egyptians, by M. Letourneau.—On the centre of creation, and the first appearance of the human race, by M. Lombard. The writer supports Signor Saporta's view that vegetable forms, which now cover our continents, have spread slowly and continuously from north to south, recent species forcing back or obliterating those of more ancient origin. The laws which Signor Saporta endeavours to establish for the diffusion of vegetable forms, M. Lombard thinks may be extended to the animal kingdom, including man, whose cradle he would seek in circumpolar regions.—Report of sixth Conference on Transformism, under the presidency of M. Duval, by M. Bordier.—Report of fifth Broca-Conference, by M. Topinard, a member of the commission for awarding the prize instituted by Madame Broca in memory of her husband. The memoirs presented between 1885 and 1888 are not numerous, but great value attaches to two among these works, viz. the general ethnography of Tunis, by Dr. René Collignon, to whom the Broca Prize for 1888 has been unanimously awarded; and ethnological researches in regard to the human remains discovered at Spy, by M. Fraipont, who received a silver medal in recognition of the great merit of his work.—On the longevity of the Berber races, by M. Letourneau.—On a Palæolithic station on Mont Roty, and on a novel flint implement, by the Abbé Blanquet.—On an ancient cemetery at Biskra, Algeria, by M. de Mortillet.—On a sepulchral dolmen, discovered at Nanteuil-le-Houdouin (Oise), by MM. Collin and Lair.—A prehistoric station at Frileuse (Seine-et-Oise), by M. Vauvillé.

THE numbers of the *Botanical Gazette* (Crawfordsville, Indiana) for March and April contain a careful study of the histology of the leaves of *Taxodium* by Mr. Stanley Coulter, and a description of a number of new North American mosses, with illustrations, by Messrs. Renauld and Cardot. It is an evidence of the attention paid in the United States to microscopical technique, that this magazine frequently contains (as do both the numbers now before us) valuable hints as to the preparation of sections of tissues for the microscope, the use of staining reagents, or objects specially well calculated to demonstrate difficult points of structure.

IN the *Journal of Botany* for April and May, Messrs. Murray and Boodle complete their account of the genus *Avrainvillea* of Siphonocladaceæ.—Students of conifers will read with very great interest Dr. M. T. Masters's attempt to distinguish the North American pines, *Abies lasiocarpa*, *A. bifolia*, and *A. subalpina*, with their varieties or subspecies. The paper is illustrated by a series of excellent woodcuts.—Most of the other papers in these numbers are of special interest to students of British plants.

THE *Nuovo Giornale Botanico Italiano* for April, a large portion of which is devoted to a report of the proceedings of the Italian Botanical Society, contains several articles of general interest besides those devoted to the Phanerogamic and Cryptogamic botany of Italy.—Dr. H. Ross has an interesting article on the assimilating tissue and development of the periderm in the branches of plants with few or no leaves.—In pursuance of his careful examination of the Nymphæaceæ, Prof. G. Arcangeli now contributes a paper on the seeds of *Victoria regia*.—Signor U. Martelli adds a species to the few hitherto known of the genus *Riccia*—*R. atromarginata* from Sicily.—Signor C. Lumia gives the result of an examination of the composition of the gas found within the inflorescence of the common fig in an unripe condition, which contains more than 5 per cent. of carbon dioxide, showing that an active process of respiration must go on within the receptacle.—Signor G. Cuboni gives an account of experiments carried on with a view to check the plague of grasshoppers by infecting them with a parasitic fungus, *Entomophthora Grylli*, which had, however, only negative results.

Rendiconti del Reale Istituto Lombardo, April.—Palæontological notes on the Lower Lias of the Lombard fore-Alps, by Dr. C. F. Parona. These notes are communicated pending the publication of the author's exhaustive treatise on the fauna of Saltrio. They deal especially with the palæontological features of the Bergamo and Como districts in connection with the various faunas that flourished in the Lombard Sea during the Lower Lias epoch. The results of this summary survey agree generally with the conclusions arrived at by Prof. De Stefani in his comparative study of the various Lower Lias formations throughout Italy.—New measurement of the curvature of surfaces, by Prof. Felice Casorati. A new solution is presented of this problem, that of Gauss being shown to be defective and inadequate, although he laid the first solid foundation for the study of the subject in his classical work, "Disquisitiones generales circa superficies Curvas."—Prof. Giovanni Zoja contributes some historical notes on the cabinet of human anatomy in the University of Pavia, dealing more particularly with the period from 1815 to 1864 under the able administration of Bartolomeo Panizza.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 9.—"Zirconium and its Atomic Weight." By G. H. Bailey, D.Sc., Ph.D., the Owens College, Manchester.

Before proceeding with any final estimation, those salts of zirconium which were at all likely to be of service in the determination were exhaustively examined with special regard to their stability in presence of reagents and under the action of heat.

It was found that in consequence of their instability and tendency to form numerous oxychlorides, neither the chloride nor the oxychloride could be relied upon, and that the sulphate was the most suitable salt to work with. Even this salt when heated above 400° C. undergoes gradual decomposition with the production of basic salts, though it is quite stable up to this temperature A special method (applicable in a number of

© 1889 Nature Publishing Group